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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/782,331

02/18/2004

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245402008400

5400

25227 7590 06/26/2008

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EXAMINER

MOVVA, AMAR

ART UNIT

PAPER NUMBER

2891

MAIL DATE

DELIVERY MODE

06/26/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/782,331	TAKENAKA, YASUJI	
	<b>Examiner</b>	<b>Art Unit</b>	
	AMAR MOVVA	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-13 and 18-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-13 and 18-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6-13-08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 7-10, and 12-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe '593 in view of Amano'766/Kunhiro '759 (cited by applicant).

a. Regarding claims 1-2, 8-10, 12-13, and 18-19:

i. Abe discloses a semiconductor light-emitting device, comprising: a lead frame (32, fig. 9) having a main surface in which a first region and a second region extending along a periphery of said first region are defined; a semiconductor light-emitting element (33, fig. 9) provided at said first region; a first resin member (35, fig. 4) having a first reflectivity with respect to light emitted from said semiconductor light-emitting element and provided at said first region to completely cover said semiconductor light-emitting element; and a second resin member (31, fig. 4) having a second reflectivity greater than said first reflectivity with respect to the light emitted from said semiconductor light-emitting element and provided at said second region to surround said semiconductor light-emitting element; wherein said first resin member includes a first top surface (fig. 9), said second resin member includes a second top surface that is provided at a

position where a distance from said main surface is greater than a distance from said main surface to said first top surface (fig. 9), and an inner wall that is provided on a side where said semiconductor light-emitting element is located and extends in a direction away from said main surface to reach said second top surface (fig. 9), said inner wall provides a reflecting surface for reflecting light emitted from said first top surface at the position where the distance from said main surface is greater than the distance from said main surface to said first top surface (fig. 9). A metallic wire (36, fig. 9) having one end connected to said semiconductor light-emitting element and another end connected to said main surface, and said first resin member is provided to completely cover said metallic wire. The lead frame is formed in a plate shape extending in one plane (fig. 9). The lead frame includes a first depression that is formed at an opposite surface with respect to said main surface and filled with a resin (34, fig. 9), and terminal portions to be electrically connected to a mounting board are provided on said opposite surface, on respective sides of said first depression (fig. 9). The lead frame includes a second depression formed at said first region, and said semiconductor light-emitting element is provided in said second depression (fig. 9). The second resin member is formed such that an area of a shape defined by said inner wall in a plane parallel to said main surface increases with an increase of a distance from said main surface (fig. 9). A shape defined by said inner wall in a plane

parallel to said main surface is one of circle, ellipse and polygon (fig. 9).

The semiconductor light-emitting device be comprised in an electronic image pickup device (fig. 9). A reference plane of a rectangular shape is provided at a prescribed distance from said semiconductor light-emitting device, luminance at each corner of said reference plane irradiated with the light from said semiconductor light-emitting device is not less than 50% of luminance at the center of said reference plane (arbitrary plane especially if it is extremely small can anticipate). Abe, however, does not expressly disclose the inner wall being exposed from said first resin member at the position where the distance from said main surface is greater than the distance from said main surface to said first top surface or that the second resin is made of polyimide.

ii. Kunhiro discloses a light-emitting device wherein the epoxy resin (201, patent abstracts) does not completely fill the resin cup (202, patent abstracts).

iii. Amano discloses a light-emitting device wherein a housing case (7, fig. 1) made of polyimide surrounds/protects the LED device.

iv. It would have been obvious to one of ordinary skill in the art at the time of the invention to have not filled the resin cup in Abe's device in order to reduce the amount of epoxy resin that must be pumped in thus saving material and time costs during fabrication and have made the

second resin/housing case of polyimide in order to benefit from the dimensional stability, heat resistance, and chemical resistance.

b. Regarding claim 7:

i. Abe discloses a semiconductor light-emitting device comprising: a lead frame (32, fig. 9) having a main surface in which a first region and a second region extending along the periphery of said first region are defined; a semiconductor light-emitting element (33, fig. 9) provided at said first region; a first resin member (35, fig. 9) having a first reflectivity with respect to light emitted from said semiconductor light-emitting element and provided at said first region to completely cover said semiconductor light-emitting element; and a second resin member (31, fig. 9) having a second reflectivity greater than said first reflectivity with respect to the light emitted from said semiconductor light-emitting element and provided at said second region to surround said semiconductor light-emitting element (fig. 9), wherein said first resin member includes a first top surface, said second resin member includes a second top surface that is provided at a position where a distance from said main surface is greater than a distance from said main surface to said first top surface (fig. 9), and an inner wall that is provided on a side where said semiconductor light-emitting element is located and extends in a direction away from said main surface to reach said second top surface, said lead frame is unfolded and in a plate shape that extends in one plane (see note below,

fig. 9) said lead frame includes terminal portions separated from each other by a slit-shaped groove (fig. 9), and said portions are formed thinner than the other portion of said lead frame (portion 32c overlayed by 32b is thicker, fig. 9). Abe, however, does not expressly disclose the inner wall being exposed from said first resin member at the position where the distance from said main surface is greater than the distance from said main surface to said first top surface.

ii. Kunhiro discloses a light-emitting device wherein the epoxy resin (201, patent abstracts) does not completely fill the resin cup (202, patent abstracts).

iii. It would have been obvious to one of ordinary skill in the art at the time of the invention to have not filled the resin cup in Abe's device in order to reduce the amount of epoxy resin that must be pumped in thus saving material and time costs during fabrication.

PLEASE NOTE: Regarding the limitation of claim 7 of the lead frame (32, fig. 9) being unfolded, examiner notes lines 64-70, col. 6 and lines 1-13, col. 7 provide an alternative embodiment for this limitation. Specifically Abe first envisions wherein that lead frame 32 to bottom surface via throughholes 32b. However, Abe alternatively embodies where the lead frames 32 are led only to the side surface (e.g. stopping when frame 32 is vertically coplanar with the resin substrate 34).

3. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe '593 in view Motokazu '044.

a. Abe discloses a semiconductor light-emitting device, comprising: A lead frame (32, fig. 9) comprising a main surface in which a first region and a second region extending along the periphery of said first region are defined; a semiconductor light-emitting element (33, fig. 9) provided at said first region; a first resin member (35, fig. 9) having a first reflectivity with respect to light emitted from said semiconductor light-emitting element and provided at said first region to completely cover said semiconductor light-emitting element; a second resin member (35, fig. 9) having a second reflectivity greater than said first reflectivity with respect to the light emitted from said semiconductor light-emitting element and provided at said second region to surround said semiconductor light-emitting element (fig. 9); wherein said first resin member includes a first top surface, said second resin member includes a second top surface that is provided at a position where a distance from said main surface is greater than a distance from said main surface to said first top surface, and an inner wall that is provided on a side where said semiconductor light-emitting element is located and extends in a direction away from said main surface to reach said second top surface (fig. 9). Abe, however, does not expressly disclose the lead framed is part of set of three lead frames spaced apart and extending in different directions from each other with each light-emitting elements emitting light of a different color, each color selected from the group of red, blue, and green.



- b. Motozaku discloses a light-emitting device wherein a set of RGB light emitting devices (1,2,3, patent abstracts) on frames (layer below chips and spacer 22 if present) extending in different directions from each other.
- c. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used Motozaku's RGB configuration in Abe's device in order to provide for a multicolor device and to reduce absorption of emission light between chips (patent abstracts of Motozaku).

PLEASE NOTE: With this modification Abe/Motozaku disclose that the lead frame is part of set of three lead frames spaced (cover, patent abstracts) apart and extending in different directions from each other with each light-emitting element emitting light of a different color, each color selected from the group of red, blue, and green (patent abstracts) and the main surfaces of said lead frames provided with said semiconductor light-emitting elements for emitting the light of blue and green, respectively, are each greater than an area of said main surface of said lead frame provided with said semiconductor light-emitting element emitting the light of red (the red frame is smaller as it has no element 22).

4. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe/Kunhiro/Amano in view of Murano '247.

- a. Abe discloses the device of claim 1 but does not expressly disclose the one end is formed in a line shape, and said another end is formed in a metal ball

shape sandwich said metallic wire between the ball-shaped metal and said semiconductor light-emitting element.

b. Murano discloses a light emitting device wherein the one end is formed in a line shape, and said another end is formed in a metal ball shape sandwich said metallic wire between the ball-shaped metal and said semiconductor light-emitting element (fig. 1).

c. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used Murano's wire connection technique in Abe's device in order to ensure good connections to the lead.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abe /Kunhiro '759/Amano.

a. Abe discloses the device of claim 1 and that the lead frame uses a copper/nickel configuration (col. 5) but does not expressly disclose the lead frame has a proportion of copper/nickel to have a heat conductivity of not lower than 300 W/mK and not greater than 400 W/mK.

b. Nevertheless, It would have been obvious to one of ordinary skill in the art at the time the invention was made to a proportion of copper/nickel to have a heat conductivity of not lower than 300 W/mK and not greater than 400 W/mK in order to provide for a disparate set of devices to be used for a wide variety of needs, since it has been held that where the general conditions of a claim are

disclosed in prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

6. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abe '593 / Motokazu '044.

a. Abe discloses the device of claim 20 but does not expressly that the inner wall is plate.

b. Nevertheless, it was conventional in the industry to plate inner walls of light-emitting cups with metal (e.g. nickel). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have plated Abe's inner wall of the light-emitting cups in order to increase reflectivity.

### ***Response to Arguments***

7. Applicant's arguments filed 6-13-08 have been fully considered but they are not persuasive.

a. Applicant argues that Motozaku's second regions do not extend on the periphery of the first region. In the rejection, however, the first and second regions may split the main surface by whatever means so long as they meet the claim limitations. Specifically there is no limitation wherein the light-emitting element may not extend onto the second region. Furthermore applicant does not state what elements split the first and second regions, thus the first and second region are defined by the fact that the second region is continuously on the

periphery of the first region. Furthermore even assuming *arugendo* that applicant does claims specific elements to split the first and second regions, examiner notes that spacers 22,21 are wider in all dimensions than the above light-emitting element.

b. Applicant argues that Motozaku's lead frames do not extend away in different directions. Motozaku, however, discloses lead frames extending toward the top, bottom left, and bottom right from the center of the base (Patent Abstracts figure in plan view).

c. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amar Movva whose telephone number is 571-272-9009. The examiner can normally be reached on 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amar Movva  
Examiner  
Art Unit 2891

am  
/BRADLEY W BAUMEISTER/

Supervisory Patent Examiner, Art Unit 2891